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NORTHBRIDGE, MASSACHUSETTS, A TOWN THAT MOVED DOWN HILL

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When we think of pioneers moving into a new region it is interesting to consider the problems with which they were faced, to try to reconstruct the environment in which they found themselves and to see how they chose between various possible adjustments. Even before the days of agitation for a planned economy, our ancestors chose their homes and village sites sensibly and planned definitely for the problems of the future, as they saw it. Sometimes later events counteracted most of the plans of the founders. As a case in point let us consider Northbridge, originally an agricultural community, but now an industrial town on the Blackstone River in southern Massachusetts.

The founders of Northbridge determined that the cultural and business heart of their town should occupy the high hill near the center of the corporate territory. The geography of the town, however, eventually nullified most of the plans of those early town fathers, and caused the concentrations of population, the villages, to develop around the fringe of the town rather than at its center. Thus it is literally true, that in spite of the well reasoned plans of the "Fathers" the town actually moved down hill (Fig. 1).

A TYPICAL SOUTHERN NEW ENGLAND TOWN

Northbridge is a typical southern New England town. It contains approximately eighteen square miles embracing at present five villages ranging in size from less than one hundred inhabitants to more than five thousand. As is true thruout New England, the term town implies a unit directly comparable with the term township, as the latter term is employed in the rest of the country, except that these towns are laid out irregularly without regard for meridians and parallels.

Concentrated population groups within the town are referred to as villages and correspond to towns and villages in other regions. Thus Northbridge, the town, with a population of 9731 people consists of the five villages, Rockdale, Riverdale, Linwood, and Whitinsville, all on the rivers bordering the town, and Northbridge Center occupying the original center.

From 1727 until 1772 Northbridge formed the northern part of the town of Uxbridge. As the population gradually crept up the river it became increasingly difficult to govern the several widely scattered settlements within Uxbridge. Eventually the inhabitants of the northern part petitioned the town fathers for permission "to be incorporated as a separate town, so that they might have a church organization and the ordinances of the gospel by themselves." That permission was granted in 1772.

The establishment of a church was practically equivalent to the incorporation of a town. The church dominated the lives of all the dwellers within its domain and served as the political, social, and religious center of the community. Town government was conducted thru the agency of town meetings which were held at stated intervals in the "Meeting House" and in which all citizens of the town were expected to take part. Obviously such a system of government had distinct handicaps in a town spread over seventy or eighty square miles of rough, densely wooded land, with very poor roads and only oxcarts or boats as means of transport. There is little wonder that the outlying communities petitioned for permission to organize their own churches as soon as they were able to support a pastor.

When the town fathers of Northbridge were faced in 1772 with the task of organizing a congregation, one of the principal problems involved a determination of the most logical location for the church. There they met a distinct geographical problem. It is interesting to reconstruct the geographical phases of the problem as it presented itself to those early settlers.

Topography of Northbridge

Figure 1 shows the topography of the area within the present borders of the town of Northbridge. It is evident from the map that Northbridge is a very hilly town. Elevations range from 225 feet in the south to a little more than 600 feet in the central east. The most extensive level lands lie in the river valleys, but most of them have a tendency toward poor drainage. Thus they were of

greater value as meadows and pastures than as crop land. Rather gently rolling land occupies the middle elevations and furnishes the most suitable crop lands for general agriculture. Many square miles of the town are entirely too steep for any agricultural use. Such areas were not only practically useless in themselves but

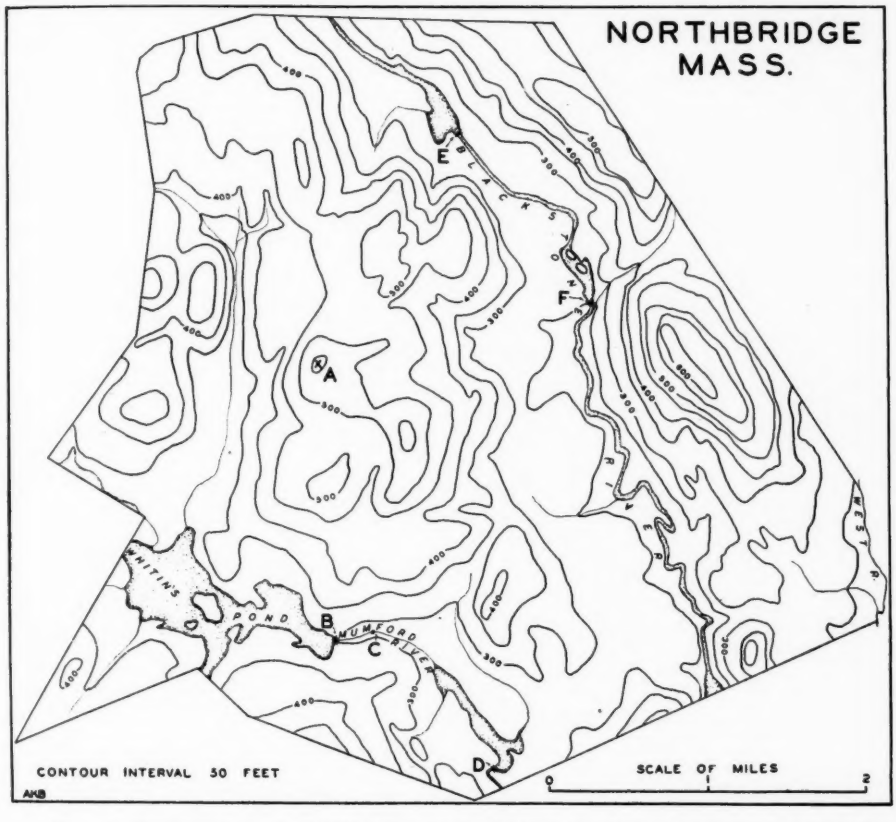

FIG. 1. Topography of Northbridge. A indicates the place chosen by the founders as the site for the principal village. B, C, and D show the locations of falls and dam sites on the Mumford River, while E and F are dam sites on the Blackstone. Notice the very hilly nature of the area with relief of approximately 350 feet. All of the ponds shown on this map are artificial and were consequently not available to the earliest settlers.

served also to isolate effectively the farms in the several more suitable districts.

Two important rivers flow thru the town. The Blackstone drains the eastern half, and the Mumford drains the southern and western parts. These streams furnished only fair routes of transport because they contained rapids and falls at several points. In its trip of six and one-quarter miles thru Northbridge, the Blackstone sus-

tains a fall of fifty feet while the Mumford experiences a fall of sixty-five feet in three miles and one-half, a considerable nuisance when one wishes to travel by boat.

SOIL, VEGETATION, AND CLIMATE OF THE AREA

The soils of the area are poor. Hard bed rock outcrops in several places, but in most of the territory it is covered with a veneer varying in thickness from a few inches to many feet, and consisting of rocky soil, heterogeneous in composition, and of glacial origin. Only the lower terraces consist of fine soils of glacial origin, and these, as stated before, are not well drained.

The vegetative covering was luxuriant. A few limited areas of swamp grasses occupied the wettest lowlands, while meadow grasses occupied a few areas of the better drained "intervale" or low divides. By far the greater portion of the town was clothed with a heavy growth of timber, mostly hardwoods in which hickory, oak, birch, and chestnut were valuable and abundant species. But, as a result of their mixed nature the forests did not sponsor the lumbering industry on anything but a purely local scale. In fact they proved a considerable handicap to the preparation of the land for crops.

The climate prevailing in the region of which Northbridge is a part is very healthful and conducive to strenuous work. The winters are moderately long but not severe, and the summers, altho they provide some uncomfortably muggy days, are for the most part delightful. Lying in one of the principal cyclone paths of the country, the area enjoys frequent, refreshing alternations of warmer and cooler weather during both seasons. The continental succession of cyclones coupled with the locational fact of proximity to the sea provides the region with abundant and well distributed rainfall.

CROPS OF NORTHBRIDGE

The usual crops of upland New England were the principal crops of Northbridge. Indian corn, wheat, rye, barley, and vegetables constituted the commonly cultivated crops. Cattle, horses, sheep, swine, and poultry likewise flourished and helped to supply the necessities of life for a subsistence community.

COMMON INTERESTS OF THE PEOPLE

The people, an essential factor in any geographic equation, advanced, slowly at first, but always with determination into the undomesticated environment. The earliest settlers came in from the

south. They were the restless, more adventurous members of the older settlements farther down stream, Woonsocket, Pawtucket, and Providence primarily; but some came also from the older settlements on the east coast. The fact of primary significance is that the early settlers had a common heritage with all their New England neighbors. Similarity in religious and political beliefs, in community organization, in domestic necessities and amenities, in handicrafts and arts, and common ancestral home, traditions, and language all combined to provide a natural bond between the mother town and her neighboring daughter settlements. Thus new settlements were rarely isolated in the extreme sense of the term.

Early Settlers

The earliest recorded settlement by white men in the area now within the confines of Northbridge occurred in 1661 when Moses Paine and Peter Brackett received permission from the lawful authorities "to purchase a title of the Indians containing about 8 miles square, about fifteen miles from Medford town, at a place commonly called Masconsapong." That territory, on the Mumford river, was the area about the falls now occupied by Whitinsville. Other settlers selected favorable sites within the region, so that by the time the town established its own church the population numbered about 450 inhabitants. Most of those people were farmers. They had forced their way into the wild country and had selected the most desirable of the intervale lands. Even in those most favorable areas the work involved in opening a farm was tremendous. Besides constructing all of the buildings and many of the furnishings from native materials the settler had to cut the forests, grub the stumps, and then, worst of all, remove an annual harvest of rocks. Consequently fields were small and furnished little more than sufficient food for the farmer's family and livestock. In spite of the very great drawbacks each homestead had to be very nearly self sufficient. The livestock, the field, the forest and the streams furnished most of the required food, and sheep provided the raw material for clothing.

A few of the more fortunately located farmers had constructed water wheels at the falls of the streams and were thus able to grind grist for themselves and their neighbors. A few of them even ran sawmills, in season, and supplied most of the local demand for sawed lumber.

The essentials of all of these geographic facts, both physical and cultural, were known to the fathers of the town when they as-

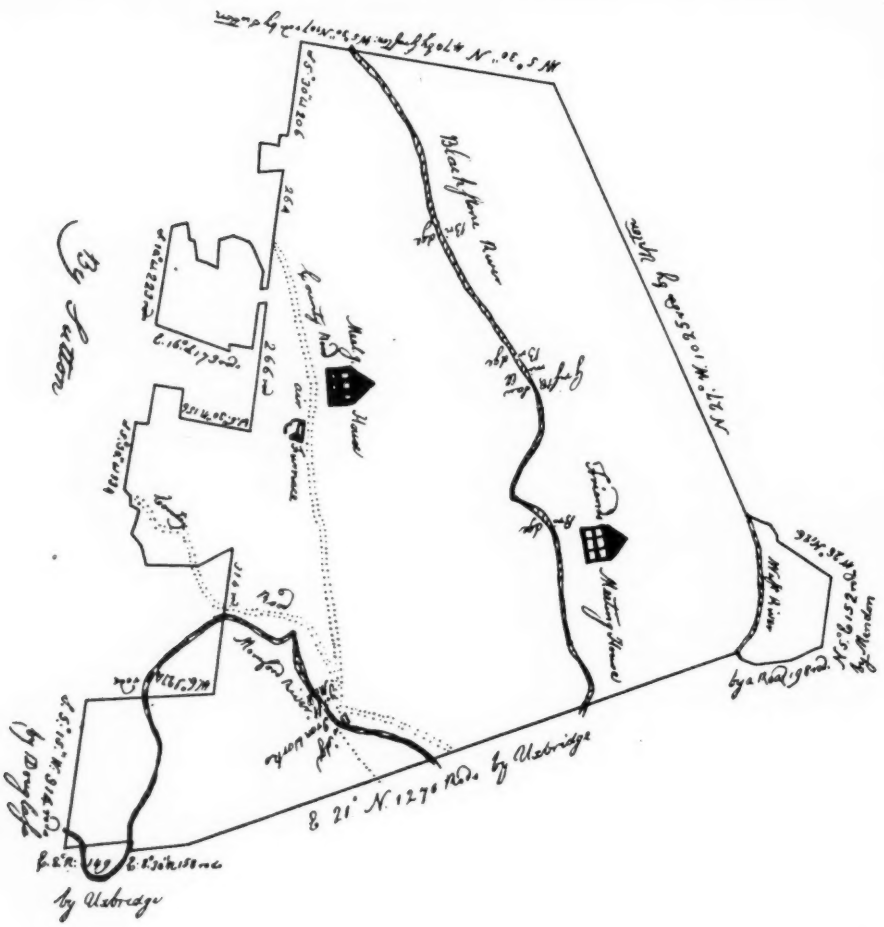

FIG. 2. This map, made 23 years after the incorporation of the town, indicates the modes of life in Northbridge at the close of the Eighteenth century. Most of the 560 inhabitants were engaged in agriculture. Notice the air furnaces, the iron works, two grist mills, and the saw mill. These industries employed only a small portion of the population because the markets were limited to local demand. The fact that there were no sizable ponds on any of the streams indicates that power had not been very efficiently developed at that time.

The note at the bottom of the map makes the following statements:

"Pursuant to a Resolve of the General Court of this Commonwealth we have surveyed the town of Northbridge and made the above plan thereof agreably (?) to said resolve.

"Blackstone River is 4 rods wide and has one Bridge over it. Mumford River is 2 rods wide and has one Bridge over it. The Court House in Worcester is North 23° west twelve miles from the meeting house in said Northbridge and said meeting house is about forty-five miles from Boston. Said town contains ten thousand six hundred and eighty acres.

Northbridge March 2nd 1795 Jona Adams, Amariah Preston } committee"

sumed the task of organizing a new church and creating a new town. One of the principal questions for them to solve was, "Where shall we build the meeting house? Where shall we establish the center of the town?" They were well aware of the fact that the meeting house would likely form the nucleus around which would eventually accumulate a village to look after the needs of the rural community. Following the establishment of the church, one might expect the development of the cemetery, the school, the blacksmith shop, perhaps even a village store, all surrounded by a little cluster of homes of the families engaged in maintaining those central institutions.

Naturally the founders desired to place that nucleus where it would be of the greatest benefit to all of the people. They had no intimation that the town would not continue its agricultural existence. It was entirely logical, therefore, that they should choose the large hill near the center of town as the site for their first meeting house. Thereby they provided the centralizing institution in a location where it and its associate institutions would be, as they thought, easily and perpetually available to the largest portion of the population (Fig. 2).

NEW FACTORS IN THE GEOGRAPHY OF NORTHBRIDGE

But Northbridge did not develop as the founders planned. New factors were very soon injected into its geographic equation so that within sixty years the power of Northbridge Center as a centralizing unit had been almost entirely neutralized.

In the early eighteen hundreds a new industry was established in the Blackstone Valley which quite completely revolutionized the course of events, not only for that valley, but for most of New England as well. That industry was the cotton manufacturing industry. After its birth in New England the industry grew vigorously, fostered by abundant capital, large, easily accessible markets, convenient access to raw material, plenty of cheap labor, and an abundant supply of power. But in Northbridge one factor, available water-power, dominated all the rest (Fig. 3).

The earliest developments were small, using very inefficiently the power available at Rockdale and Riverdale on the Blackstone, and at Whitinsville and Linwood on the Mumford. Overflow labor from farms manned the mills. The first raw materials were carted in on ox carts and the products carried to markets in the same way. The start was not pretentious, but once established, the industry grew, and before many years surpassed agriculture as the leading occupation of the town.

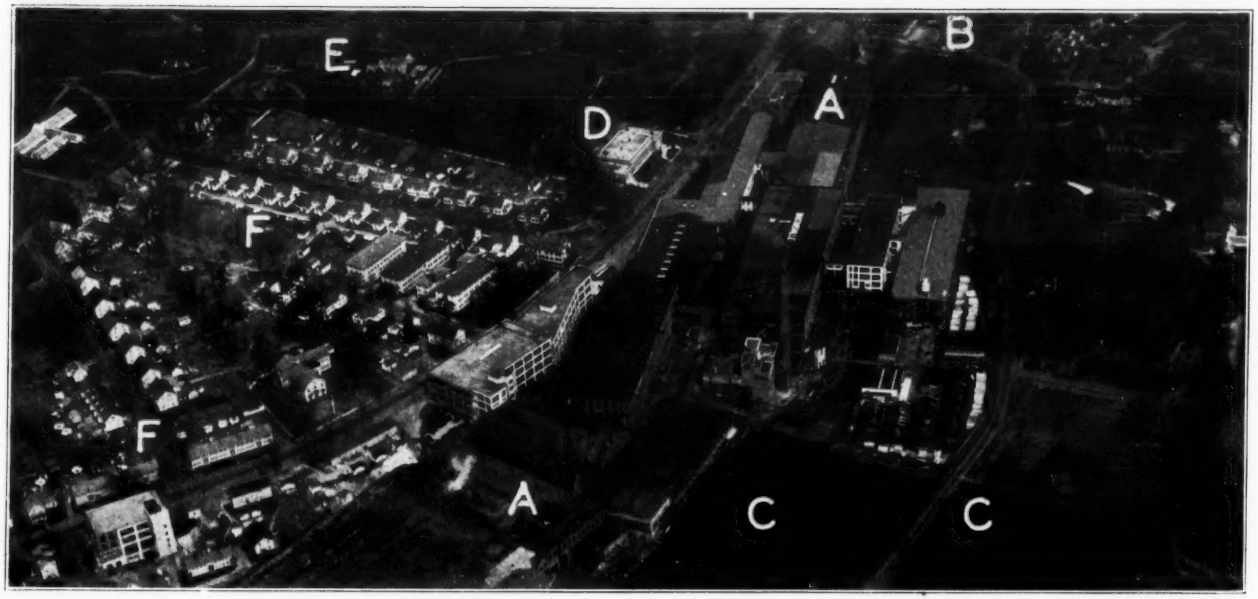

FIG. 3. The Industrial Heart of Northbridge, The Mill Center at Whitinsville

The big plant between A-A is the Whitin Machine Works where textile machinery of all sorts is manufactured. At B one sees the lower part of the mill pond. That part of the pond lies about twenty feet lower than the part of the pond indicated by C-C. The pond thus flows towards B. Just beyond the point where the road crosses the pond at B there is another fall of ten feet. The building at D is a large recreation building given to Whitinsville by the Whitin family, owners of the machine works. E is the spacious estate of the mill owner, while F-F indicate homes of mill workers. Rows of almost identical houses are typical of mill villages such as this. Whitinsville prides itself, justifiably, on the attractiveness of its mill workers' homes. Courtesy of the Whitin Machine Works.

Development and Use of Power

Let us see how the various factors reacted to the introduction of industry into the community and how the town consequently moved from the hill top to the valleys.

The physical features resulting from glaciation in Northbridge proved to be as great a benefit to manufacturing as they had been handicaps to agriculture. In conjunction with favorable climatic factors they furnished an abundance of the motive power which dominated the industrial development of the town. The rough topography in this region of abundant rainfall produced numerous swift streams and waterfalls as well as many easily ponded areas which could be used to increase the available water-power. The even distribution of rainfall kept the flow of the streams quite steady and dependable. Loose, gravelly, glacial soil served as a sponge, as did the forests on the slopes, to unify the flow of water into the streams after heavy rains and during spring thaws.

The Mumford is the more important of the two streams within the town, altho its length, drainage area, and volume are not so great as those of the Blackstone. The energy of the Blackstone was generated at two ponds, each with about ten feet of head. The Mumford has three power sites, each with its own pond and also several other storage ponds for the purpose of regulating the flow to the falls. The upper dam on the Mumford generates the most power. It is the site upon which the original cotton mill was located and upon which the machine works has grown. Each of these five power sites proved large enough to cause the establishment of mills on its location at some time in the town's history. Several of them have had a succession of mills and factories as time has passed and the industrial system progressed. In all, they have exerted the controlling influence which has caused the redistribution of population in Northbridge.

The changing character of manufacturing and new inventions made a more efficient use of the resources possible. Nearby towns also exerted their influence upon the growing manufacturing industry of Northbridge. But their influence was perhaps not so great in causing manufacturing to grow up there as in determining what kind of manufacturing should be carried on. In 1799 Samuel Slater and Moses Brown started the first power mill in America at Pawtucket, Rhode Island, near the southern end of the Blackstone Valley. They prospered and before long established or encouraged other factories in many nearby towns. Their influence spread grad-

ually up the valley, and cotton mill organizations acquired between 1807 and 1814 most of the old lumber and grist mill sites along the lower Blackstone. The cotton mill which was established in Whitinsville in 1809 was the third in the valley.

The first labor supply for the factories and shops was recruited from the farms. The amount of labor expended in agriculture in those early days was enormous. It is little wonder that the younger folk were willing to accept the long hours and low wages of the infant industry in preference to what the farm had to offer. Until 1850 most of the mill operatives came from the farms, altho immigrants began to appear about 1830. The population grew rapidly thruout the period when Northbridge manufacturing was in its formative period. The population increased from 544 in 1810 to 4,603 in 1890, and by far the majority of the people were mill workers, who, naturally, found it more expedient to choose the valleys near the mills rather than the hill tops for homes.

Capital for investment in manufacturing has always been available in New England. By careful management, by starting in a small way, by branching from one type of manufacture to another as opportunity occurred, and by keeping the industry quite closely within one family, capital has been used very efficiently in Northbridge.

Raw Materials and Markets

It has always been necessary for the industries of that town to import their raw materials. That condition, however, was less of a handicap during the water-power period than at any other time, because the markets were near at hand, transportation facilities were being improved, and all competing concerns were laboring under similar disadvantages.

The chief markets for the products of Northbridge during its developmental period were located in New England and the Northeastern States. Cloth, at first of low quality, furnished a rather local market but as competition increased, the quality was improved and the market extended. In 1834 the largest manufacturing institution in the town turned its attention from the manufacturing of cloth to the manufacture of textile machinery. The handicap of having to import all the raw iron, steel, and fuel was bountifully overshadowed by the advantageous location in the heart of the country's greatest market for textile machinery. The advantages were reflected in success and expansion and thus in an increased population in the valley villages, particularly at Whitinsville on the Mumford.

The period of industrial expansion embraced the period of transportation improvement in the United States. At the opening of the period, ox cart transport was in vogue. Over the rough, unimproved trails of that period such transport methods were, cer-

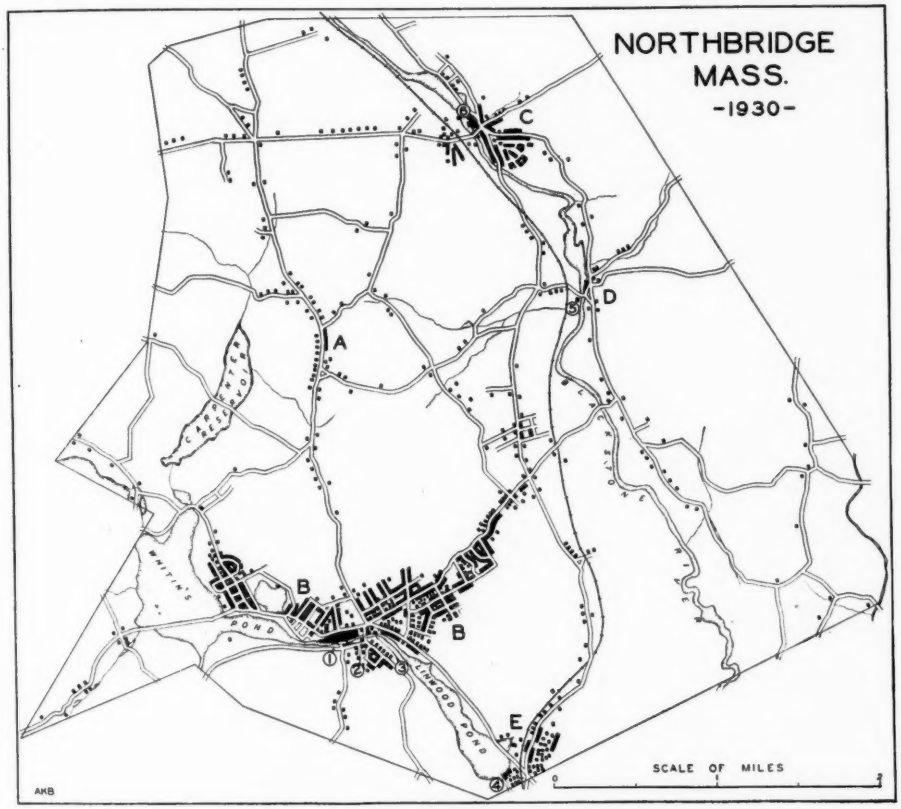

FIG. 4. Notice the concentration of dwellings, business places, and factories about the power sites. A represents the village of Northbridge Center, the site of the original meeting house for the town. B, C, D, and E are the villages of Whitinsville, Rockdale, Riverdale, and Linwood, respectively. All constitute developments of the industrial period. The numbers in the circles show the location of the industrial plants around which the population gathered. 1. Textile machinery works. 2. Spinning ring company. 3. Abandoned cotton mill, the parent concern of the two machine companies. 4. Cotton mill. 5. Paper mill. 6. Cotton mill, still owned, controlled, and managed by the family of the original founder. Present owners are of the fourth generation.

tainly, slow, inefficient, expensive, and to say the least, not conducive to the development of a highly industrialized inland community. In 1828 a canal, extending along the course of the Blackstone, was built from Pawtucket thru Northbridge to Worcester. For a number of years that cheaper, more efficient route gave a considerable impetus to the industries of the town.

In spite of the very obvious advantages of canal transport, trouble over the diversion of water from the river to the canal became acute. So much water was required to keep the canal in operation that water-power development was considerably disturbed. The disagreement over water rights became so serious that in 1847 when the railroad from Worcester to Providence was completed, most mill owners along the route were glad to see the canal scrapped in favor of the railroad. The railroad soon became the chief artery of trade thru the community. Aside from its advantages of speedier shipments and expanded markets it gave a further impetus to manufacturing by allowing the diversion of water from the canal back into the river and by making possible cheap importation of coal, the basis for most of the expansion from 1880 to 1910.

CHANGES IN THE CHARACTER OF THE TOWN

Contemporaneous with the change in occupation of the townspeople was a change in the character of the town. With most of the inhabitants engaged in industrial activity the town assumed a distinctly urban character in place of the former agricultural aspects (Fig. 4). The self sufficient farm home was given up for the mill tenement, the garden was replaced by the grocery store, the spinning wheel by the clothing store, and the husking bee by the club and pool hall. The little country school graduated to a complete school system, while the humble volumes of the pastor and school master lost prestige to the free public library.

Thus the town of Northbridge reacted to the new set of factors injected into its old geographic environment. In abandoning agriculture as the dominant occupation of the community, the dwellers found it not only convenient but necessary to violate the well made plans of their forefathers and come down from the sterile hill tops to congregate at the falls in the streams where a less precarious livelihood awaited them.

GEOGRAPHY: ITS CURRICULAR CLASSIFICATION

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To the busy geography teacher it may matter little what classification is given her subject in the school curriculum. Back of her own thinking, however, there is some sort of a philosophy which determines her outlook and her method of approach to the subject of her choice. Such a philosophy may never have been expressed or even consciously formulated, yet it must be there if she is at all consistent in her point of view. In every lesson that she plans there is an element of self which gives direction and distinction to her work; and the results obtained may be far different if in her mental make-up geography is looked upon as a physical science, a social science, a little of both, or neither. Since this is true it seems all the more strange that there should be such a diversity of opinion, among leading geographers, in the classification of geography. This diversity in point of view is effectively presented in *The Journal* of September, 1933, and 1934.

To develop such a necessary philosophy or over-view we may think of courses of studies, listed in the curriculum, as groupings of related knowledge which man believes to be true. This grouping, a purely artificial device, has become necessary in order that this information may be made readily available as a stepping stone for further advances. Each subject listed thus represents a summary of the best that is known in that line. Elementary text books, written presumably by authors who know the field as a whole, aim to give a selection of the most vital facts in each particular field, arranged so that the student may travel quickly and surely over the road that others have trod so laboriously before him. Some sciences like chemistry have their material so well organized and standardized that there is a well recognized succession; others like geography are so young that little if any organization or standardization has yet taken place.

DIVISION OF SUBJECT MATTER NECESSARY

A natural result as knowledge accumulates is this sub-division into less inclusive units. Here a real difficulty arises, however, for knowledge is so interrelated and so dovetailed together, each fact so dependent on another, that the sharp artificial boundary lines drawn are in reality only gradations; only in the school curriculum

and unfortunately in the minds of some teachers are these sharp distinctions real. On the other hand with equal clarity it must be appreciated that the distinction between botany and zoology is real altho there may be no unquestioned criteria for the separation of some microscopic forms into plants and others into animals. We may not be able to chart where darkness stops and dawn begins, but there is no uncertainty in our minds between night and day. Likewise geography has a distinct field all its own.

All subjects in the curriculum have as a fundamental concept the advancing of human welfare. Each is equally important in so far as it aids in meeting this ideal. Because one subject deals with more primary material than another does not make it any the more or less vital, worth while, or important. To believe otherwise is as unsound as to say that the acorn is more important than the oak or a foundation stone is more vital than the keystone of the arch. Each is equally important to the other. In this respect geography may be compared to the keystone and not to the foundation stone. Each subject has its special significance in the whole structure and all are related to one another. Some have more interrelationships, others fewer, but all are a part of this man-accumulated knowledge.

A broad outlook is needed to appreciate the significance of the niche in which lies the geographer's main field of thought, and the relation it bears to other branches of knowledge. Thinking by primitive man was doubtless by the aimless, blundering paths of "trial and error." Each new generation trod over the same paths except as it learned by example or word of mouth. Progress was necessarily slow. As far as known the Greek philosophers were the first to attempt a real interpretation of nature. During their period of supremacy two important ways or systems of investigation were thought out, and these are standards for thinking even to this day. These two schools of thought are represented by the names of two great intellectuals—Plato and Aristotle. The fundamental difference in their point of attack is most important. Plato, appreciating the well-known fact that the senses cannot always be relied upon for accuracy, held that basic truths cannot be gained thru the senses. When basic facts are tinged with inaccuracy there can be no sound superstructures. Fundamental truths, therefore, can be gained only by intuition. The soul, the mind, and not the senses must be the real arbiter and from this background has come the non-science attitude—the humanistic studies. Aristotle held

the opposite point of view. He recognized the need of observation as well as sound reasoning in getting at the truth, and his insistence, that our basic knowledge must come from correct observations, has placed him as "the father of modern science."

Altho the point of view of Aristotle is dominant now, that of Plato held well into the period of the Renaissance. Relatively little material progress was made during that order of intuitive thinking. The system was abused until such questions as "How many angels can dance on the point of a needle" became the order of the day. The opprobrious term, "Arm chair philosopher," of the modern scientist has its origin here and refers to the scientist who depends on intuition instead of observation. In the period of the Renaissance began also the rapid rise of the scientific method in thinking, unquestionably the dominant one today altho both views are still represented in the school curriculum, in the humanities and in the sciences.

FUNDAMENTAL DIFFERENCES

In a broad over-view subjects in a curriculum may fall, therefore, in one of two classes, the humanities or the sciences. The humanistic studies are those definitely pertaining to human qualities, attributes, such as languages, literature, art, religion. An appreciation of literature and art is not a matter of observation, not an analysis and a synthesis but a power of the soul. Scientific studies, in contrast, are based on careful observation of phenomena from which by sound reasoning definite conclusions may be drawn. Since in all observations there is a certain personal equation to be taken into consideration, no observations can be taken as fundamentally sound. A number of observations must be made, then in time a nearer approach to the truth will be gained. Scientific methods have used certain principles of thought in their search for truth. (1) The directly observed facts of experience constitute the only reliable basis for thinking. Nature is the ultimate arbiter. "Why does a live fish weigh more in a bucket of water than a dead one?" The scientific attack is—Let's weigh it and see. (2) Observed facts must be classified according to relationships. From the more important and constant of these the so-called "laws of nature" have their origin. (3) The constant testing of these hypothetical assumptions by prediction and verification is mandatory. A natural law today may be modified or replaced by a new one tomorrow.

All sciences have the same method of attack but not all sciences

have the same type of material to work with nor is the point of approach necessarily the same. On this basis they are commonly divided again into two groups, the natural or physical sciences and the social sciences. The distinction between these two groups is fairly definite and fundamental. The physical (used in the Greek sense of nature including animal and plant life) sciences and their laws are based on the concept that the entire universe at any given instant is a necessary result or product of the state of the universe immediately preceding; and, in turn, *predetermines* the state of the universe immediately following. This implies that the sequence of natural phenomena never varies, "the same causes always produce the same effects." On this basis only can laws be established.

This inevitableness in nature leads to certain problems in the common philosophy of life. It means that the scientist by premise must believe, if he is consistent, in a universal determination, human will not excepted. In the main, the physical scientist is willing to accept this dictum as he is interested solely in physical phenomena. There are those, tho, to whom this thought is abhorrent for they must deal also with conduct of people whom they believe to have a certain element of choice. They are willing to grant this inevitableness in nature but say that it is perfectly conceivable there are phenomena entirely outside the range of mechanistic science. They hold out for the "Freedom of the Will."

Here lies the fundamental distinction between the physical and the social sciences. The physical sciences, therefore, are spoken of by some as the exact sciences, or even the pure sciences. There is no variable element in the steps of this type of thinking, or if so, it can be properly equated. The social scientist takes the other view. He is willing to grant that certain effects follow certain causes but that one cannot treat man and his conduct in this manner. Man is not an automaton, not a creature of physical law. There are times when his best judgment may lead him to say: "I do not choose to run." The holder of this point of view may find it hard to prove that choice after all is free; yet human conduct, at least appears at times to act as tho there were "Freedom of Will."

With this seeming freedom of action by man there is a variable element introduced into scientific thinking which cannot be equated. Conclusions drawn with this variable element involved cannot be very conclusive. Fundamentally, therefore, the social sciences are at a tremendous handicap. The handicap is chiefly in their methodology in ever being forced to recognize this variant. They are also handicapped by the lack of a sympathetic understanding of their

problems by those who do not deal with the human element. The lack of ability to lay down laws and make correct forecasts is the greatest weakness of the social sciences. Economics, the most highly organized in the social science field, is notable for its failures in its attempts at business forecasts. Yet the economists, in this day, are doing the planning for the nation's welfare of tomorrow.

The Place of Geography

Into this general setting of organized subject matter geography in a relatively few years has made a very special place for itself. What particular place is assigned it is of little moment but what that classification implies matters much, for presumably this relationship is based on fundamental distinctions. Since the same general subject matter may be used in different fields but for different ends and with different points of view, the objective and the method of attacking the problem become the more important. The modern historian relates his historical data to a background. The sociologist is ever trying to map the results of his field of investigations. The same is true of the economist and the political scientist. The geographer does much the same using much the same material, but with another point of view. His point of attack and technique are different and his results necessarily are also quite different. It is the method and not the materials that is distinctive, the kind of thinking and not the subject matter that is vital.

If the philosophical concepts, as here outlined are sound then a curricular classification is not difficult. Geography very definitely belongs to the sciences and not to the humanities, for geographic concepts are gained by observation and not by intuition as is the case with the humanities. This, of course, does not imply that it is all observation in one case and all intuition in another. If the deterministic element, this reasoning from cause to effect, is the major factor that distinguishes a physical from a social science, then the classification must be based on the dominant type of reasoning used. If modern geography thinks of the physical environment as having definite deterministic influences on man and his activities then geography surely is a physical science. If on the other hand we do not assume to be able to lay down principles and laws in which certain causes always produce certain effects inevitably then geography just as surely is a social science. Geography scarcely can be both, consistently, when the two ways of thinking cannot be harmonized.

CAN WORLD-MINDEDNESS BE INFLUENCED BY INCIDENTAL TEACHING?

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Within the past few years considerable attention has been focused on the subject of world-mindedness. That the need exists for developing such an attitude in the individual is recognized. Yet the method by which the task might best be accomplished is somewhat speculative. Obviously, such an objective cannot be obtained in a "hit-or-miss" manner. The responsibility of establishing a procedure and the attaining of results rests with the school, but the actual application and the entire success of the program depends upon the classroom teacher. It is here that the teacher of geography has an excellent opportunity to build desired attitudes, for in geography, more than in any other subject, men are viewed in their true relationships and in a manner conducive to unbiased consideration and understanding. Yet there must be carefully prepared patterns to follow in teaching if our work is to be most effective. Research in this line is somewhat lacking. Such research will tend to reduce confusion and to eliminate practices which, tho well meant, may be harmful and detrimental to the very purpose for which they are instituted.

PURPOSE OF THE STUDY

The purpose of the study was to determine whether or not high school pupils could be influenced to become more internationally minded by incidental teaching in Economic Geography. A further purpose was to determine whether or not the incidental technique herein employed was effective enough to justify its use by the classroom teacher.

In order to ascertain the extent to which attitudes could be influenced in the geography classroom it was first necessary to find the solutions to several problems. The problems were as follows: (1) To what degree is the pupil internationally minded before studying Economic Geography? (2) What effect does the study of Economic Geography have upon the pupils' attitudes toward international affairs? (3) What change of attitude is developed by incidental instruction toward world-mindedness in geography? The solution of these problems necessitated the use of an attitude test or scale. Also, frequent testing during the study was desired to

determine progress. With this in mind, the following experiment was conducted by the writer in the geography classes of the Connellsville High School.

Procedure

The degree of world-mindedness was determined by administering the Neumann-Kulp-Davidson Test of International Attitudes to 150 pupils comprising four classes of Economic Geography. This test consisted of 108 items on nationalism and internationalism toward which the pupil could signify the degree of feeling he held toward each item. A high score on the test indicated a tendency toward conservatism; a low score indicated liberalism, or world-mindedness.

Such a method of testing when followed by the same or a similar test at the close of the study would indicate the degree of change in word-mindedness. However, growth continues in spite of any manipulation on the part of the teacher, and in order to determine the amount of growth from incidental teaching it was necessary to have the experiment carefully controlled. For this the parallel group method was employed, with pupils matched on the basis of attitude score and I.Q. From those originally tested, 80 pupils were satisfactorily matched and were divided into control and experimental groups.

In order that there should be some definite directions toward which influencing might take place, it was decided to direct teaching toward increased respect for the Germans, increased opposition toward war and an increased preference toward the Chinese. To measure the initial and final attitudes on each of these phases use was made of the respective Thurstone Attitude Scales. The phases were stressed in consecutive order, each for a period of four weeks. A comparison of the scores on Forms A and B of each test revealed any change of attitude within each group, and a comparison of the gains on the test revealed which of the two groups had made the greater change and the direction of that change.

Teaching Procedure

The teaching method employed in the instruction of both groups was the Unit Mastery Technique. Subject matter was unitized into economic regions of the world, and was studied with the aid of mimeographed sheets which stated the objective, the reference readings, and the unit sub-problems. Products and economic problems relating to each region and to the world were developed. An

introductory talk was given by the teacher for each unit. The pupils were then given time during the following class periods to complete the unit. Frequent periods of discussion were held during which the pupils were encouraged to ask questions and to report findings on outside readings and experiences. Products studied were brought into the classroom whenever possible. Library references were listed and numerous floor talks were given. In the case of the control group all material studied and discussed was strictly within the bounds of Economic Geography. On the completion of the unit the teacher directed the assimilation period and the pupils were tested on the material covered.

For the experimental group the above technique was used and, in addition, the experimental factor was introduced by the teacher who was instructor of both groups. This factor was incidental teaching. It consisted of carefully planned procedures to develop in the pupils a feeling of intimacy for people of distant lands. Where the control group had been limited to the study of economic relationships, interesting side-lights were now brought in to develop a consciousness of brotherhood and independence and to instill a desire to combat racial prejudice. The name "incidental," when applied to method, is in a way self-explanatory, for it applies to that seemingly spontaneous and apparently "by-the-way" technique of teaching.

During the study of a region the teacher frequently turned aside from the usual consideration of the subject to mention a custom of that region, or to outline a problem of the people to show that their problems are similar to the problems which confront us. Again, frequent mention was made of the achievements of far-off peoples, of their heroes, and of the part that those lands play in making the United States the world power that it is today. In the study of Germany not only were economic conditions and products considered but also, the type of people who could produce such a highly efficient and powerful nation on such limited resources as did prewar Germany. The error of pilfering and ruining a defeated nation was stressed. Causes of war were developed and followed by an explanation of the fallacy of risking man-power and property at the least provocation. The suspicions of South American countries toward the United States were dwelt on, along with their hesitancy in international dealings. Occasionally only a few words were mentioned by the teacher in passing over material, at other times ten to fifteen minutes were spent on an aside to the class. On several

occasions floor talks on customs and problems of our neighbor nations were given by the pupils.

Thruout the study every precaution was taken to prevent pupils from feeling that they were being preached to, and to prevent a feeling of weariness that might result from a too frequent reference to any one topic. However, one point was stressed and that was, that since we were students of geography, we should make an effort to find out more about the people whom we were studying in order that we might better understand their problems and, thereby, their relations to us. Suggested sources were the newspapers, the radio news, and movie newsreel in addition to the material studied in school.

Upon the completion of the eighteen week period the Neumann-Kulp-Davidson test was again administered to determine the final attitudes.

TABLE I
MEAN GAINS OF GROUPS ON ATTITUDE TESTS

Attitude Test	Control Group			Experimental Group				Ratio of Difference to the Standard Error
	Mean I.S.	Mean E.S.	Mean Gain	Mean I.S.	Mean E.S.	Mean Gain	Mean D.G.	
Germans	6.99	6.997	.0075	6.93	6.975	.045	.0375	.155
War	4.692	5.052	.36	4.652	4.535	−.1175	.477	1.66
Chinese	5.437	5.975	.53	5.54	6.037	.497	.0325	.10
Neumann-Kulp-Davidson Test	3.979	4.028	.049	3.971	3.890	−.080	.1295	1.60

I. S.—Initial Score
E. S.—End Score
D. G.—Difference of the Gains

INTERPRETATION OF DATA

The mean initial and final scores for each test, and the increase or decrease in attitude as indicated by the test scores are shown for each group in the accompanying table. The mean initial score for each group on the Neumann-Kulp Test revealed that the 40 pupils of the control group were very evenly matched with their fellows in the experimental group. Also, considering that the highest possible score on the test, 6.37, indicated a tendency toward conservatism and that the lowest possible score, 1.63, indicated liber-

alism, both groups held to an equal degree a somewhat neutral attitude toward international affairs.

The interpretation of the initial scores on the test Attitude Toward the Germans indicated that both groups held practically the same attitude, and that that attitude bordered on a strong preference toward the Germans. The mean final scores showed very little change in attitudes as far as either group was concerned. Yet such changes as did occur showed increased preference. Even tho the slightly higher score was held by the control group the greater gain in preference was shown by the experimental group.

For the test on war, since the lower the score the greater was the prejudice against war, the interpretation was that both groups were prejudiced against war and that a slightly greater prejudice was held by the experimental group. The gains on the test revealed that group had become even more strongly opposed to war while the control group not only failed to gain in prejudice but had actually decreased the amount of prejudice which it had previously held. Where the control group had been moderately opposed it now expressed a neutral attitude toward war. Therefore, the experimental group again showed a greater gain in the desired direction.

Mean gains on the Chinese test showed that both groups had increased the amount of preference held toward the Chinese. This time a slightly greater gain was made by the control group, tho the experimental group showed a greater preference.

The final results of the study as shown by the Neumann-Kulp-Davidson Test, revealed that the experimental group increased in world-mindedness while the control group became more conservative. Expressed in percentage, the increase in world-mindedness was two per cent and the increase in conservatism was one and two-tenths per cent. The difference of three and two-tenths per cent was in favor of the experimental group. Likewise, it was found that twenty-six members of the experimental group increased in world-mindedness while thirteen increased in conservatism and one remained unchanged in his attitude toward international affairs. In the control group only fifteen pupils became more liberal while an increase in conservatism was shown by twenty-five pupils. This meant that thirty-seven per cent of the pupils of the control group had increased in world-mindedness as a result of studying Economic Geography, as compared to sixty per cent who showed an increase in the experimental group. Thus, the difference of

twenty-three per cent in the number of pupils may be attributed to the incidental technique.

Conclusion

On the basis of the foregoing study the following conclusions were drawn:

(1) High school pupils can be influenced to become more internationally minded by incidental teaching in Economic Geography, since three of the four test results were in favor of the experimental group.

(2) Certain pupils will increase or decrease in world-mindedness regardless of whether or not an effort is made to influence them.

(3) Evidence of influencing may be observed within a semester's time.

(4) Pupils tend to become more internationally minded in Economic Geography as a result of incidental instruction toward world-mindedness. At the close of the study the control group was, on the average, one and two-tenths per cent less internationally minded than it had been at the beginning of the study while the experimental group showed a two per cent increase in world-mindedness.

(5) A greater number of pupils increase in world-mindedness as a result of influencing through incidental teaching. Thirty-seven per cent of the pupils of the control group showed an increase as a result of studying Economic Geography, as compared to an increase of sixty per cent in the experimental group.

Tho to some the gains shown may seem small, yet they are in the desired direction and are evident enough to be of encouragement in attitude influencing. The fact that an increase in world-mindedness has been made justifies the application of the technique by the class-room teacher and suggests the possibilities that may accrue from such a procedure.

IN THE DATE GARDENS (IRAQ)

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Dates are a product of Hot Desert Climates, whose characteristic features are little or no rain and very high temperatures during the day time. The chief exporting countries are Algeria, Tunis, Morocco, Egypt, and Iraq, particularly Iraq, which produces 80 per cent of the world's commercial supply of dates, only one-third of the crop being consumed locally. The special region is in the Shat-el-Arab, the delta of the combined rivers Tigris and Euphrates, and it is with this region that this lesson deals.

Dates, the subject of this lesson, grow in countries where there is little or no rain and never any winter. Such lands are called deserts. They are places that are *desert-ed,* because there is not enough water.

DESERT PLANTS

It is not to be supposed that nothing at all grows in a desert. As a rule there are very few parts of any desert where no kind of plant is to be found. Some desert plants have very long roots that can go deeply down in search of water; others have thick, fleshy stems and leaves in which water can be stored for a long time; and others have their stems and leaves coated with a thick layer of wax to keep in any moisture that the plant may contain. Nearly all desert plants have sharp spines and thorns that prevent animals from eating them. None of these plants, however, are of much use, if any, to man.

In most deserts there are a few places where water can be obtained. As a rule this water has fallen as rain, a long way off, and then soaked along slowly under the ground. Where it can be reached by wells or where it comes to the surface in springs men and animals can live and some things, especially dates, can be grown. Such fertile spots in a desert are called *oases;* they may be quite small or they may be large enough to hold several villages. In one or two deserts the water is brought by a big river and then, on or near the banks of the river, may be found a number of people who have left the thirsty land beyond to make their homes where life is easier.

IRAQ

The chief date-growing district in the world, in a country called Iraq, is really one huge oasis, made fertile by a big river. It follows the banks of the river for a hundred miles or more, but it is only one to two miles wide because the farther we go from the river the

less water there is. And once we leave the shade of the palms we pass into a barren sandy land where, during the day time, hot breezes lick the face with a tongue of flame.

In Iraq, as in other desert regions, there are people who live in the desert itself with tents for houses. They move about from place to place with flocks, herds, and camels that feed on anything that they can find. Others live in towns or villages in the oasis. The peoples of the desert and the oasis are, in Iraq, certain tribes of Arabs.

Fig. 1. A date garden in Mesopotamia

Tho one part of the oasis belongs to one Arab and another part to some other Arab, the whole forms one huge garden of dates divided into plots by long mud walls or banks. The date palm, like most other kinds of palms, is a tall straight tree. It may, in fact, reach a height of 150 feet, higher that is than any of the school buildings. At the top there is a crown of long, beautiful feathery leaves beneath which hang two to six bunches of dates. Each bunch may have as many as two hundred dates on it and, as they ripen, the weight of the heavy clusters of golden brown fruit bend the orange-colored stalks downwards. Some bunches are so heavy that they have to be held up by the nearest leaf stalks to keep them from breaking.

The Date Palm

The Arabs, everywhere, say that the date palm must have its head in the fire and its feet in the water. The fire, of course, is the sun that never fails to pour down a staggering heat. The water is provided by the river and carried thru the oasis by canals and ditches that have been made, here and there, thru this hundred-mile-long garden. There is no music so pleasant to the date-grower

as the sound of the gentle trickle of the water in the canals. In these same waters women wash the clothes and barefoot boys splash and paddle.

To carry the water to the feet of the palms it must be lifted on to the land. This may be done, in our times, by a pump worked by an engine, but much more often it is lifted by oxen. They are hitched to long ropes, at the other end of which skin bags are fastened. The ropes pass over a tall framework of wood and as the oxen walk away from the river they lift the bags. When the bags are high enough, the oxen are stopped and the water poured out into a little ditch, whence it flows into the gardens. The oxen then walk back to the river where the bags drop into the water to be refilled. Backwards and forwards they go all day long, with their drivers, satisfying the thirst of the stately palms.

FIG. 2. A cluster of dates

Underneath the cool green shade the farmer grows wheat, millet, vegetables, and enough grass to feed small herds of goats and sheep, and perhaps a few cattle. At times the Arabs of the desert come into the oasis to buy hay and other fodder for their own animals. They also come, at harvest time, to help in the work of packing.

REED HUTS

During the month of June the date-growers begin to get ready to employ cutters and packers—mostly women—and to build, on the sides of the rivers and the creeks, living-huts for themselves and for a number of clerks, and places in which the work of packing the dates will be carried on.

These huts are built of the tall reeds, some of them twenty feet long, that grow along the banks of the river. The reeds are gathered and dried and then tied into big bundles about three feet in diameter. Two bundles are bent over in a half-circle and tied together at the top to form a framework. The arches are placed about five feet

apart in such a way as to make it possible to join them and build upon them a hut about twenty-five feet long.

The framework and the ends are covered with reed mats, an opening being left at one of the ends to serve as a doorway, but the door, if so it can be called, is nothing but a hanging mat. Huts of this kind can be built in a day and can easily be taken down and shifted somewhere else if the people who live in them want to move.

Date Gathering

The harvest months is September and about the middle of that month the hard work begins. First of all the dates have to be gathered. There are no ladders tall enough to reach the fruit so the cutters, who are usually the growers, have to climb the trees instead. This is not quite so easy as it sounds because the date palm has no branches. The climber takes a rope, passes it around the tree to form a loop and fastens the ends to a wide sash that he wears round his waist. When he puts his feet against the tree and leans back in the loop, the rope is tightly pulled and he is firmly held. While he is cutting the heavy branches the rope keeps him quite safe, and his hands are free for his work.

Fig. 3. Bringing home a bundle of reeds.

As he cuts the bunches from the tree he lowers them into baskets placed at the base of the palm where they are collected by women and children who take them down to the packing sheds on the banks of the river. The sheds are long, low huts, built in the way already described, and will hold up to 200 workers.

Packing

After the dates have been weighed by the clerks they are sorted and packed, one by one, in boxes. There are two classes of packers, those who come from the villages in the oasis and those who come from the desert. The village Arabs are much the quicker of the two: they can fill five boxes while a desert Arab can fill but two. The

village Arabs are stronger, heavier, and taller than the desert folk perhaps because they are better fed.

The dates are carefully put into the boxes in layers. When four

FIG. 4. An Arab village on the Tigris. Copyright; Underwood & Underwood

or five layers are ready, they are pressed tightly together by means of a smooth board which is a little smaller than the box. An Arab places the board on the top of the layer and then stamps on it with his feet. When the boxes are full they are nailed down, taken from the packing huts to the Arab boats and sent down the river to the

big cargo boats that will carry them to England, America and France.

As there is no wood in Iraq that for the boxes has to be brought from elsewhere, chiefly from Norway and Russia. The wood arrives ready cut into the right lengths, and all the Arab has to do is to nail the pieces together.

It may be noted that it is only the best dates that are so carefully packed into boxes. The cheap, common sorts are put into sacks where they are tightly pressed together by the bare feet of the Arab workers.

The Workers' Food and Houses

We have next to ask ourselves how the date-growers live, or, a better question, how *can* they live? They can eat, for instance, chiefly the things they grow. The staple food is dates, fresh, dried or cooked. In the dry state they are sometimes ground into a kind of flour. The pits (or stones), it may be mentioned, are also ground up and given to cattle and goats.

Fig. 5. A home of the "cultivator" Arab. It is built of sun-dried brick with a roof of reeds.

Wheat or rice is pounded into flour, kneaded into dough, and baked into flat cakes about a quarter of an inch thick; they look something like little pancakes. The baking oven is made of mud and the fuel that heats it is either old date stalks and leaves or dried cow-dung. There is no wood and no coal. A few of the little cakes and a handful of dates is the usual meal.

The house, like the food, must be made of what the people can find around them. We have already seen that the huts used by the clerks, coolies, and packers are built of reeds from the rivers. The houses of the owners of the palms are of sun-dried mud bricks: there is no difficulty about obtaining either mud or sun. The mud, in order to make the bricks hold together better, is often mixed with chopped straw and grass. As there is practically never any rain the roof is flat and here, in the cool of the evening, the people

gather to chat, smoke, or sleep. There are few windows, but beneath each house there is a cellar. In these cellars it is possible to be cool during the fierce heat of the summer days.

There is very little furniture in any of the houses. The chief things are a few earthenware jugs, a few coffee cups, and beds made of dried reeds and the leaves of the date palm. Everybody lives and sleeps on the ground, and there are no tables, chairs, or bedsteads.

Land is worth too much to be wasted on streets, and in the villages the passages between the houses are very narrow and winding. If the village be large enough there will be a temple or mosque with a tall tower. There are no bells in such a temple, and when it is time to pray the priest goes to the top of the tower and calls out in a loud voice that can be heard by all who live near at hand.

AN EASY TIME

The date-grower has a rather easy time. He has never to work quite as hard as most of the other people about whom we are learning. His chief trouble is that the gardens may be flooded if the river rises too high. In that case the dates will fall from the trees while still green. The women are much harder workers than the men as they have to cook and do other housework as well as toil for long hours in the plantations. The men never hurry, and like to leave everything to the last moment.

The children, too, have rather an easy time. They collect date pits (stones) from roads and gardens, and sell them to men who turn them into charcoal, and they make "water wings" out of the broad lower parts of the palm leaves for use when they go bathing in the creeks. They collect the dates which ripen and fall to the ground before the bunches are cut down and, of course, they help in the packing.

"BACKSHEESH!"

It is great fun to watch them running almost wild, in and out of the palms, as happy as the day is long. If, however, they see a white man coming they at once rush to meet him shouting "Backsheesh! backsheesh!" which means "Please give me a present." They are full of daring and mischief, and as they wear little or nothing at all they are not afraid that climbing trees or falling in the water will do much harm to their clothes. From the time when they can crawl they are allowed to do much as they please. They have very few schools tho more are being built. It is not certain, however, that the

children will go to school even when schools have been provided for them.

As we have said, when night-time comes people may sleep outside on the roof or inside on the floor. But wherever they sleep they will hear the sound of frogs. Almost as soon as the setting sun begins to color the tips of the palm trees red and gold the frogs begin to croak and, as the darkness grows, the croak becomes a roar, hundreds upon hundreds of the frogs joining to sing their evening song.

A LESSON WITH THE GLOBE

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The globe is the only representation of the earth that gives the correct idea of the form of the earth. The early study of the globe and its continued use in the classroom are essential to the formation and growth of correct mental concepts of the earth as a whole. It must be borne in mind, also, that the globe is only a symbol in miniature of the real earth. From the earliest use of the globe in the classroom, every effort should be made to have the pupil appreciate the globe as a representation, a symbol, of the *real earth,* only a small portion of which can be seen at one time.

One of the early lessons to be learned from the globe is the distribution of land and water on the earth's surface in the form of continents, islands, oceans, and seas. This elementary, but fundamental, idea of world geography is represented accurately upon the globe, whatever the size of the globe may be. The convenient six-inch globe serves well many purposes of instruction, altho larger globes are desirable for classroom use.

These suggestions are written from the observation of a six-inch globe which is easily examined, rotated, and measured as it stands on the desk.

1. On the globe trace the Equator. What name is given to that portion of the earth north of the Equator? south of the Equator?

2. Rotate the globe and examine the land areas and the water areas represented. Is the earth's surface more largely covered by land or by water?

3. Turn the globe so that you are looking directly at the South Pole. Is the South Pole on land or on water? What is Antarctica? Is the Southern Hemisphere made up largely of land or of water?

4. Turn the globe so that you are looking directly at the North Pole. Is the North Pole on land or on water?

5. Does the Northern Hemisphere have more land or less land than the Southern Hemisphere?

6. Look carefully to see whether there is more land or more water in the Northern Hemisphere. (The water surface of the Northern Hemisphere is considerably larger than the land surface.)

7. Turn the globe so that you can see North America and South America. Where does the Equator cross America? Which of the Americas lies in both hemispheres?

8. Minnesota is near the center of the land mass of North America, and Central Brazil is near the center of the land mass of South America. What direction would you travel in making an airplane journey from Minnesota to Central Brazil? From Central Brazil to Minnesota? What direction is South America from North America? North America from South America? If you travel due south from Minnesota, where do you pass with reference to the westernmost tip of South America? If you travel due north from Central Brazil where do you pass with reference to the easternmost tip of the mainland of North America?

9. Name the two continents that lie in the Western Hemisphere. Which one extends nearest to one of the poles?

10. Turn the globe so that you can see Europe, Asia, Africa, and Australia. Which of these continents is crossed by the Equator? Which lies wholly south of the Equator? Which lies wholly north of the Equator?

11. Name these four continents in order of their size. Which two are larger than either North America or South America? Which are smaller than either of the Americas?

12. Compare the extent of land area of these four continents found in the Northern Hemisphere and in the Southern Hemisphere.

13. What is the direction from the center of Europe to the center of Africa? from the center of Europe to the center of Asia? from the center of Asia to the center of Australia? from the center of Australia to the center of Africa? from the center of Africa to the center of Europe?

14. In the Western Hemisphere where are there two large groups of islands? In the Eastern Hemisphere where are there two large groups of islands?

15. Is there more land in the Eastern Hemisphere or the West-

ern Hemisphere? In the Southern Hemisphere or the Northern Hemisphere?

16. Turn the globe so that you are looking at the center of the Pacific Ocean. Compare its size with the land area of all the continents and islands. (The area of the Pacific Ocean is considerably larger than the total land area of the world. It covers more than one-third of the entire area of the earth.)

17. Examine the Atlantic Ocean and the Indian Ocean as represented on the globe. Find the Antarctic Ocean forming a water-ring around Antarctica. Find the Arctic Ocean, and note how this small ocean separates the large northern land masses.

18. Look at the globe in different positions. Think of the land surface and the water surface of the earth. Look at the continents. Compare them as to size, position with reference to the Equator and the poles, and direction from each other.

19. As you make these studies, endeavor to think of the real earth, 8000 miles in diameter, 25,000 miles in circumference, its surface covered with *real* water on which ships sail and storms make high waves, and *real* land made up of plains, plateaus, and mountains on which people live wherever they can find material for food, clothing, and shelter. Look about you and see some of this *real* earth that is represented by a tiny spot on the globe. See more of this *real* earth as you travel by automobile, railroad train, or airplane. Remember that the globe is the best symbol, or representation, of the *real* earth, but in using the globe we must learn to think, also, of the *real* earth which it represents.

INTEREST STIMULATING DEVICES

At the beginning of the school year we discovered that few pupils in the seventh grade could identify states on an outline map of the United States. After a conference on the matter we decided to arrange an exercise to be presented as an assembly program. It was carried out in the following manner.

Two young men of the training group who were teaching manual arts supervised the making of a huge map of the United States. Then they arranged the stage for five levels, similar to bleachers, which provided standing room for the forty-eight pupils, each of whom was to represent a state.

Two young women directed the pupils in finding a list of the official state flowers and selected quotations describing these flowers.

We used a McKinley Wall Map as a pattern and, with the aid of squares of heavy brown wrapping paper, made an enlargement four times the original size. This large map was then cut up into separate states, one state pattern for each child in the group. Each child was then assigned to a given place on whatever stage level to which his height was best adapted. This placement of each child was designated on the stage by a numbered circle. Each child thus represented a state in its proper location in the Union.

On assembly day as each pupil came to the stage he displayed the map of the state he represented. He then named the state and its official flower, gave the quotation, and found his place on the platform. The order in which the states appeared gave opportunity to learn locations as well as to study contrasts and comparisons in size. After all were in place, a chord from the piano was the signal for each child to raise his own map in front of his face. The pattern thus formed was a creditable representation of a map of the United States. While the maps were held in this position, the whole school joined in singing America the Beautiful.

Judging from the "Oh's" and "Ah's" of the audience this was an entertaining and instructive exercise.

During Book Week the state maps served a variety of purposes in making a very successful exhibit for the English Department. The drawing supervisor proposed continuing the theme and directed the making of a beautiful floral map which we have as a permanent part of our Geography Library equipment.

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AN INTERNATIONAL PICNIC

This device has been used to aid in place study and map work. The children are permitted and encouraged to use maps freely and to substitute the correct name for the place indicated within the parentheses. They should have access to a history or an atlas map showing the provinces of France and the Avon River as most textbooks and wall maps do not give them.

With the hopes of hastening the coming of the 1 (a city in Russia) of Peace and Goodwill among nations, Señor 2 (city in Spain) suggested an International get-together in the cool and shady 3 (a forest) of Southern Germany.

On a 4 (a cape in Ireland) and pleasant day in June, a jolly, friendly crowd appeared from all parts of Europe. Soon after all had assembled 5 (the old capital of Norway) was chosen queen of the festivities. She wore a 6 (a fiord in Norway) embroidered 7 (a sea north of Russia) dress with 8 (a city in Denmark) blue accessories and a large 9 (a city in Italy) straw hat. 10 (a province in Russia), close friend, wore a 11 (a town in Holland) blue dress, a large 12 (a city in Italy) hat and carried an 13 (a city in Russia) fur-trimmed cape from which came a faint 14 (a river in Germany of 15 (a city in Germany).

They rode to the field on 16 (a sea), 17 (province in western Russia), 18 (a river in France) 19 (a group of islands) ponies and took their places under friendly 20 (an island in Mediterranean Sea) trees to enjoy the morning's program.

21 (a river in Scotland) gave a 22 (a city in Ireland) for each person there, 23 (a city in Bulgaria) chose for her contribution the 24 (a city in England) of The Dog of 25 (section of France), 26 (a city in Italy) gave an interesting account of the eruption of 27 (a volcano in Italy), 28 (a city in Russia) entertained them with a vivid picture of the 29 (a city in Russia) Fairs. The last number before the 30 (a lake in Sweden) sounded for dinner was the Forest scene from Midsummer Night's Dream put on by the Stratford-on- 31 (a small river in England) players. The leading girls were 32 (a city in France) 33 (a lake in Switzerland) and 34 (a river in Russia). 35 (a river in Russia) and 36 (a city in England) took the leading parts for men.

The call for dinner was hailed with joy by all the 37 (country in central Europe) crowd. There were 38 (a city in Poland) of food including 39 (a city in Germany), 40 a city in Germany), 41 (a city in Austria) sausages, 42 (a city in France) and 43 (the adjective of Switzerland) cheese, and 44 (a country in Asia Minor). Having an abundance of 45 (a country) there was a large quantity of 46 (proper adjective of a country) fried, 47 (the name of a sea) potatoes. 48 (a city of Belgium) sprouts and 49 (a city in Spain) onions were also served. 50 (a city in France) furnished the fruit died. The food was modern 51 (a city in Germany) stove but not one thing was 52 (a city in Switzerland) ed.

Europeans drink but little water, so the picnickers were provided with other beverages such as milk or egg nog made from the milk of the 53 (one of the Channel Islands), and 54 (another of the Channel Islands) cows of the vicinity. Also a choice of 55 (a city in Portugal, 56 (a district in France), 57 (another district in France) and 58 (a city in Spain) wines. In the midst of the festivities 59 (a lake in Switzerland) caused much excitement and chaos by exclaiming: "There's a 60 (a city in France)." 61 (a mountain in Switzerland) dropped a much prized 62 (a city in Germany) china bowl. 63 (a city in France) climbed a small tree which caused many 64 (a river in Russia) and 65 (a city in Germany) to fall into the wine. After all it was only 66 (a city in Switzerland) big 67 (a Pass in Switzerland) dog.

Gathered around a camp fire made of 68 (a city in Ireland) wood, all joined in singing popular national songs such as the 69 (a river in Russia) Boatman, Blue 70 (a river in central Europe), Watch on the 71 (city in Germany), The Miller of the 72 (a river in England) and the 73 (a city in France).

At a late hour the party broke up. Instead of going directly home, many began to 74 (city in Italy) about Europe visiting places of interest. Many expressions of approval were made which warranted the conclusion that each had had a 75 (a city in France) time and thought the idea a very 76 (a river in France) one.

KEY

1. Archangel	13. Astrakhan	25. Flanders	36. Chester
2. Madrid	14. Oder	26. Florence	37. Hungary
3. Black Forests	15. Cologne	27. Mt. Vesuvius	38. Lodz
4. Clear	16. Black	28. Odessa	39. Hamburg (ers)
5. Christiania	17. White	29. Nijni Nov-	40. Frankfort
6. Hardanger	18. Rhone	gorod	(ers)
7. White	19. Shetland	30. Horn	41. Vienna
8. Copenhagen	20. Cyprus	31. Avon	42. Rochefort
9. Milan	21. Clyde	32. Nancy	43. Swiss
10. Georgia	22. Limerick	33. Geneva	44. Turkey
11. Delft	23. Sofia	34. Neva	45. Greece
12. Leghorn	24. Reading	35. Don	46. French

47. Irish
48. Brussels
49. Valencia
50. (Orange (s)
51. Nuremberg
52. Berne
53. Jersey
54. Guernsey
55. Oporto
56. Burgundy
57. Champagne
58. Malaga
59. Constance
60. Lyon
61. Rosa
62. Dresden
63. Lorraine
64. Bug (s)
65. Worms
66. Basel
67. St. Bernard
68. Cork
69. Volga
70. Danube
71. Rhine
72. Dee
73. Marseille
74. Rome
75. Nice
76. Seine

BERTHA A. SIDWELL

State Teachers College
Silver City, New Mexico

A HANDY PERFORATED MAP

When a teacher wishes to have a map drawn on the blackboard, a perforated one will prove to be a handy device. Any desired map may be drawn or traced from a large projection onto a piece of wrapping paper. After the map has been drawn and all necessary features placed on it, holes are punched around those features with a small nail. This perforated wrapping paper can be placed against the blackboard. With an eraser that is full of chalk dust, beat around the perforation. This will leave a blackboard outline map that will prove very useful and can be used again many times.

RALPH S. HARRIS

Lincoln School,
Wood River, Ill.

NOTE

Send descriptions of your interest-stimulating devices to the JOURNAL. We will be pleased to pass them on, as an aid to others, thru the pages of the JOURNAL. There must be hundreds of teachers who have worked out these aids in teaching. Make your description brief, clear, and exact so that another teacher may follow your directions.

EDITOR

EDITORIAL NOTES AND NEWS

A planting of forest shelter belts thruout the drought area from Canada to Texas is to be undertaken by the U. S. Forest Service. A hundred belts, each 7 rods wide, will be planted in parallel rows about a mile apart. The rows will extend north and south over a width of one hundred miles extending in length from Canada to Texas. Only the land planted to trees will be acquired by the Government, the land between strips remaining in private ownership. A chain of nurseries will be established to grow the seedlings of whatever varieties of native trees are best adapted to a particular soil and climate. It is hoped the shelter belts will decrease the surface velocity of the winds so as to check evaporation and soil erosion, and afford havens of shelter for various types of animal life. Similar shelter belts have been used in Italy, Hungary, and Russia as well as those planted by our early prairie settlers. Large-scale planting of the wind-breaks will be under way by 1936, and the planting of the entire 1,820,000 acres in the project should be completed in 10 years. It will roughly coincide with the 18 inch rainfall isohyet.

According to a recent statement made by Dr. Henry G. Knight of the U. S. Department of Agriculture, insect pests cause an annual two billion dollar damage to crops, trees, livestock, stored fabrics, grains, feeds, and foodstuffs. Without insecticides it would be impossible to feed the world as society is organized today. New insecticides are constantly being sought, especially those whose residues are least harmful to human health.

In a recent release from the Department of Agriculture, Washington, D.C., Mr. Weightman, Weather Bureau Meteorologist, advises people outdoors during lightning discharges to keep away from trees, especially large ones, and from isolated shelters. The best thing to do is to lie down flat on level land. Only a few automobiles and airplanes have been struck by lightning, the former owing their security to their closeness to the ground and the latter to the effective insulation of air. Street cars with overhead trolleys are seldom struck as the trolley wires and supports act as a lightning rod.

The proceeds from the sale of the new Federal hunting stamp, designed by J. N. ("Ding") Darling, is to be used to provide funds to help conserve ducks and other migratory waterfowl by the establishment of sanctuaries. The sale is estimated to provide more than a half million dollars annually. One of these stamps must be affixed to the regular hunting license by every hunter over 16 years of age.

Two new sound pictures on the preservation of wild life have just been released by the U. S. Department of Agriculture. Prints of these films in 35 mm. size may be borrowed from the Office of Motion Pictures, U. S. Department of Agriculture, Washington, D.C.

School Life, monthly journal of the Federal Office of Education, and official mouthpiece for the principal Government activities in the interest of education, announces a four page enlargement and a number of new features of aid to educators and to high school debaters. It is available from the Superintendent of Documents, Washington, D.C.

Since air temperatures on the average rise five degrees for each 1000 feet of mine depth, and since water seepage increases the humidity, miners in the Rand's deepest gold mines often have to toil in nearly saturated air in temperatures more than 100 degrees Farhenheit. The efficiency of the miners may then be only 30 per cent high. In order to increase this efficiency and reduce accidents and loss of life, air conditioning equipment exceeding anything thus far used will be installed in the Robinson Deep Mine near Johannesburg to pour cooled and dehumidified air to depths of more than 8000 feet.

The publication of the illustrated *Geographic News Bulletins* by the National Geographic Society, Washington, D.C., will be resumed early this fall. They are issued weekly, for thirty weeks in the school, at a very nominal price. They embody facts of current issue coming from all parts of the earth.

If you desire to bring your high school students in contact with those of other countries, write to the World League of International Education Associations, 521 Phelan Building, San Francisco. The League will arrange contacts thru inter-scholastic correspondence. In a number of countries an official Center for such correspondence exists. Further interest is encouraged by local club activities which in turn may be affiliated with regional Junior International Institutes. The World League has sponsored a world-wide radio program on May 18, International Good Will Day, and is now looking forward to the building up of high school International Museums.

The Graduate School of Geography of Clark University announces a three-month field course, September 12 to December 12, 1934. The instruction is in charge of the regular staff of the Graduate School, assisted by visiting professors who will join the party at various points along the route, which will be east of the Appalachians to Miami then west to New Orleans, and north via the Great Valley, and across Pennsylvania to the Finger Lakes of New York. Special study will be centered at a number of camps located in regions with some outstanding contrasts in relief, climate, natural vegetation, soils, and industries. The camp arrangements include cabin trailers with living accommodations. The party will be (limited to twenty) students.

Those wishing official information on economic and political conditions in the United Kingdom and the British Empire may secure same from the British Library of Information in New York, 270 Madison Avenue. The Dominions of Canada, Australia and South Africa are not included as they maintain separate representatives in the United States. The publications available are not made especially for the American public but are the official documents prepared for the various peoples of the British Empire. The Library can be consulted free of charge. The usual loan provision is made for the circulation of documents.

GEOGRAPHICAL PUBLICATIONS

Our World and Ourselves, A series of Four Books Published by the American Book Co., 1933. Our Neighbors Near and Far, Frances Carpenter; Our Home State and Continent, Brigham and McFarlane; Our Continental Neighbors, Brigham and McFarlane; How the World Lives and Works, Brigham and McFarlane.

In this series the authors have made a noticeable advancement in promoting efficiency in geography in education. The books are planned for a curriculum having geography in grades IV to VII, inclusive.

Organized to build "for the child a vivid picture of the great world in which he lives," and written in a pleasing style similar to that of the earlier Frank G. Carpenter readers, but with more geographic interpretation, *Our Neighbors Near and Far* narrates imaginary journeys across the United States and in ten other regions of the earth, the order of presentation being based chiefly on contrast. Many pictures of high geographic value aid in building concepts of human responses to natural environment in the selected areas. Some teachers may prefer to rearrange the order in which the regions are presented so as to develop a realization of the variation in the heat from the sun and the resultant differences in the life of people who live at various distances from the equator. The statement on page 1 that "geography is just another name for finding out about how people live and work in their different lands" does not do justice to the *why* as brought out frequently in the book; e.g., pages 12-14; 98, and 130. Altho some of the suggested technique, such as that used to establish concepts of direction and maps, may be questioned, the book has excellent material for building the initial geographic concept of the earth.

The reviewer has at hand only the New York edition of *Our Home State and Nation,* the preface of which states a commendable purpose; namely, to organize the book that "in content and in the order and method of presenting geographical facts and principles the text fully meets the course of study for the fifth grade." Physiographic description and historical narration are used in introducing North America as a whole, the home state, the various groups of states, and other parts of North America. From the viewpoint of the function of geography in the fifth grade, it is of questionable value to give prominence to physiographic facts without direct use of them to promote understandings of relations between them and human life in specific regions. Cases in point are: (1) young valley and mature valley, page 32; (2) Natural Regions, pages 95-102; (3) Hawaiian Islands, pages 276-277. In contrast to the prominent type of organization, which states physiographic facts and then enumerates facts of human life, stands the presentation of the southern states, in which the geographic individuality of a region is developed thru understandings of how people are responding to the natural environment. Teachers well trained in the technique for making the best use of facts applicable to geography in elementary education will find much good material in this second book.

Our Continental Neighbors, written for Grade VI, deals with all the continents excepting North America. As stated in the Preface, "The treatment of the different regions and peoples has been expanded or restricted on the basis of their relative importance in our modern world." This book, like any other book or course of study that attempts to treat in one year all the earth, excepting North America, must necessarily emphasize restriction, rather than expansion. This leads to enumeration of facts, such as are stated under Principal Products, page 43; Manufactures, page 149; Irrigation, page 313; Agriculture, page 346. In spite of this handicap, the volume is to be commended for the geographic thinking promoted and for the information given to aid in understanding the geographic personalities of the leading countries. However, a word of caution is needed with reference to the word "because" as used on page 119. Geographers need to keep

in mind that the particular man, or people, is a factor in the response to the natural environment in a given region.

How the World Lives and Works may be considered as comprising three parts: the first deals with Our World in Space, Maps, and Grafs; the second, occupation and population patterns of the earth; the third, resources and productions of outlying areas of the British Empire, France, the Netherlands, Italy, Japan, and the United States. This last book in the series is chiefly "a world review including a study of world resources."

The series merits commendation for the quality of numerous pictures and maps, and for having a separate book for each grade. More expansion is needed, not only in this series but also in others, particularly in *Our Continental Neighbors*, if geography is to function educationally as it should. However, the responsibility for the attempt to include the learning of the geography of such a large part of the earth in one year lies with neither the publishers nor authors of the immediate future.

H. HARRISON RUSSELL

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Sir Napier Shaw. **The Drama of Weather.** 279 pp., 74 photos, 110 figures and maps. Cambridge University Press, The MacMillan Co., New York. 1933. $3.50.

Dr. Shaw was for many years director of the British Meteorological Office, which is the British weather bureau. His work was so distinguished that he was made President of the International Meteorological Committee, and won many other honors. During the past fifteen years he has prepared the comprehensive "Manual of Meteorology," published in four volumes.

The Drama of Weather is a more popular presentation of material selected from the elaborate "Manual of Meteorology" together with some new material. Few schools or individuals can afford the four volume work, but the very attractive volume being reviewed presents a surprisingly large amount of the most interesting material and choice illustrations of the expensive work.

Whereas most American elementary books on the weather are written by persons with no particular qualifications for the task, "The Drama of Weather" is the summary work of one of the world's most distinguished investigators of weather. Several outstanding British scientists in other fields have become widely known to educated Americans because they have done for their science what Sir Napier Shaw has undertaken for meteorology.

The Drama of Weather is superbly illustrated by half tones and highly illuminating maps, charts and grafs. The plan of the book is popular, and the matter dealt with is of deep interest. Almost any alert person will enjoy and obtain much enlightenment from even a brief examination. A careful reading should abundantly repay the effort.

The book is divided into eight parts. 1) Prologue: Pageantry in the sky, which includes many fine photographs of different sorts of clouds. 2) Ideas of the ancients and moderns as to the weather. 3) The Watchers, a popular account of the instruments used. 4) The Score: A summary of the temperature, winds and rainfall of the world and of various localities. 5) The Chorus. Rhythmic aspects of the records; causes of the rhythms, days, weeks, months, seasons and years. Weather forecasting based on rhythms. 6) The Weather Map presents the play. A study of the causes of weather changes, including an excellent presentation of the recent Norwegian theory of the equatorward movements of masses of colder air and the poleward movement of masses of warmer air: The Polar Front theory. 7) Epilogue: The Weather map of the future. 8) Appendix of climatic data, and the index.

The Drama of Weather conveys in attractive form a summary of an immense amount of investigation and study on a subject of widespread interest. It is abundantly worthwhile for school libraries, teachers of geography and all others really interested in the weather.

Indiana University STEPHEN S. VISHER

The JOURNAL *of* GEOGRAPHY

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Uruguay and the Uruguayans. By Ben F. Lemert 289

Dr. Lemert is an instructor in economic geography at Duke University and formerly served in a similar capacity in Ohio State University and Columbia. Some of his recent contributions include the Cotton Textile Industry of the Southern Appalachian Piedmont; They Rayon Industry in the United States, in the JOURNAL OF GEOGRAPHY, February, 1933, and the Furniture Industry of the Southern Appalachian Piedmont, in *Economic Geography*, April, 1934. Dr. Lemert has traveled extensively thru South America, Europe and North Africa. During the past summer he traveled by car thruout the western part of the United States and far south into Mexico. Much of the material for the present article was gathered as he traveled across Uruguay on foot.

The Geographic Unit: A Basis for Advanced Social Studies. By Helen M. White 304

Miss White is an instructor in geography in the Theodore Roosevelt High School, Washington, D.C., and author of an article entitled Diagrammatic Map making, which appeared in the JOURNAL OF GEOGRAPHY, September, 1933. Miss White has been doing a very constructive piece of work in high school geography teaching.

Geography Laboratory Work in the Teachers College. By J. Sullivan Gibson 309

Mr. Gibson was formerly in the Department of Geography, State Teachers College, Bowling Green, Kentucky, and has been completing the work of his doctorate at Clark University during the past year. He is author of Agriculture of the Southern High Plains, and Land Economy of Warren County, Kentucky, which appeared in *Economic Geography*, July, 1932, and January and April, 1934.

The Columbia Basin Project: What It Is. By Victor Roterus 314

Mr. Roterus is a graduate of the University of Chicago and is now an instructor in economic geography in the School of Business Administration in the State College of Washington.

Some Recent Observation in Human Adjustments to Natural Environment in a Government Survey Project. By Frances Russ .. 318

Miss Russ is a graduate of Miami University, Oxford, Ohio, and has been doing field work during the past summer for the Civil Works Adminstration.

Another Lesson. By Mary C. Mellyn 320

Dr. Mellyn is an Assistant Superintendent of Schools, Boston, Massachusetts. For many years she taught in the Department of Geography of the Boston Teachers College, and has carried her interest into the administrative field. Her broad human interest is conveyed effectively in the present article.

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